WE CLAIM:

1. A dual action valve for molten metal applications, comprising:

a housing defining an inlet opening;

a valve body disposed within the housing, the valve body defining an inlet conduit in fluid communication with the inlet opening for receiving molten metal into the valve body and an outlet conduit for dispensing molten metal from the valve body;

an inlet float member disposed in the inlet conduit and movable with molten metal flow into the valve body to open the inlet conduit, the inlet float member adapted to close the inlet conduit upon termination of molten metal flow into the valve body; and

an outlet float assembly disposed in the outlet conduit and movable with molten metal flow in the outlet conduit to permit molten metal outflow from the valve body and prevent reverse molten metal flow in the outlet conduit.

2. The dual action valve of claim 1 further comprising an inlet seat liner disposed in the inlet conduit, the inlet float member coacting with the inlet seat liner to close the inlet conduit upon termination of molten metal flow into the valve body.

3. The dual action valve of claim 2 wherein the inlet seat liner comprises a tapered outer surface cooperating with a tapered recessed portion of the inlet conduit.

4. The dual action valve of claim 1 wherein the inlet float member has a greater density than the molten metal admitted to the valve body, such that the inlet float member closes the inlet conduit under the force of gravity upon termination of molten metal flow into the valve body.

5. The dual action valve of claim 1 wherein the inlet float member is spherical shaped.

6. The dual action valve of claim 1 wherein the outlet float assembly comprises a carrier member and an outlet float member supported by the carrier member, the outlet float member having a lower density than the molten metal admitted to the valve body, such that the outlet float member is buoyed up from the carrier member to close the outlet conduit if reverse molten metal flow occurs in the outlet conduit.

7. The dual action valve of claim 6 wherein the outlet float member is spherical shaped.

8. The dual action valve of claim 1 wherein the outlet float assembly comprises a carrier member and an outlet float member supported by the carrier member, the carrier member and outlet float member having a combined density lower than the molten metal admitted to the valve body, such that the carrier member and outlet float member are buoyed up to close the outlet conduit if reverse molten metal flow occurs in the outlet conduit.

9. The dual action valve of claim 8 wherein the carrier member and outlet float member are formed integrally as a one-piece unit.

10. The dual action valve of claim 8 wherein the outlet float member is spherical shaped.

11. The dual action valve of claim 8 wherein the outlet float member is removably supported by the carrier member.

12. The dual action valve of claim 8 wherein the outlet float member is removably received in a cup-shaped recess defined in the carrier member.

13. The dual action valve of claim 12 wherein the outlet float member and the cup-shaped recess have mating spherical shapes.

14. The dual action valve of claim 8 wherein the outlet conduit defines an outlet chamber, and the carrier member and outlet float member are disposed in the outlet chamber.

15. The dual action valve of claim 14 wherein the carrier member defines a central passage in fluid communication with the outlet chamber for passage of molten metal through the outlet chamber.

16. The dual action valve of claim 15 wherein the carrier member further defines a plurality of branch conduits connecting the central passage to the outlet chamber.

17. The dual action valve of claim 15 wherein the outlet float member is removably received in a cup-shaped recess defined in the carrier member, and wherein the carrier member further defines a pressure seal port connecting the cup-shaped recess and central passage for molten metal fluid communication therebetween.

18. The dual action valve of claim 14 further comprising an outlet seat liner disposed in the outlet conduit immediately upstream of the outlet chamber, the outlet float member coacting with the outlet seat liner to close the outlet conduit upon reverse molten metal flow in the outlet chamber.

19. The dual action valve of claim 18 wherein the outlet seat liner comprises a tapered outer surface cooperating with a tapered recessed portion of the outlet conduit.

20. The dual action valve of claim 8 further comprising an outlet seat liner disposed in the outlet conduit, the outlet float member coacting with the outlet seat liner to close the outlet conduit upon reverse molten metal flow in the outlet chamber.

21. The dual action valve of claim 20 wherein the outlet seat liner comprises a tapered outer surface cooperating with a tapered recessed portion of the outlet conduit.

22. The dual action valve of claim 1 wherein the housing has a top end and a bottom end, and wherein the top and bottom ends each define circumferential seal grooves for creating seals with molten metal flow conduits to be connected to the top and bottom ends of the housing.

23. The dual action valve of claim 1 further comprising a spring member disposed in the inlet conduit downstream of the inlet float member and coacting with the inlet float member to assist in closing the inlet conduit upon termination of molten metal flow into the valve body.

24. The dual action valve of claim 1 further comprising a spring member disposed in the inlet conduit downstream of the inlet float member and coacting with the inlet float member to assist in closing the inlet conduit upon termination of molten metal flow into the valve body, and wherein the outlet float assembly further comprises an additional spring member coacting with the carrier member to assist in closing the outlet conduit if reverse molten metal flow occurs in the outlet conduit.

25. A dual action valve for molten metal applications, comprising:

a housing defining an inlet opening;

a valve body disposed within the housing, the valve body defining an inlet conduit in fluid communication with the inlet opening for receiving molten metal into the valve body and an outlet conduit for dispensing molten metal from the valve body;

an inlet float member disposed in the inlet conduit and movable with molten metal flow into the valve body to open the inlet conduit; and

an outlet float assembly disposed in the outlet conduit and movable with molten metal flow in the outlet conduit to permit molten metal outflow from the valve body, the outlet float assembly comprising a carrier member, an outlet float member supported by the carrier member, and a spring member coacting with the carrier member, the carrier member and spring member adapted to close the outlet conduit and prevent reverse molten metal flow in the outlet conduit.

26. The dual action valve of claim 25 further comprising an inlet seat liner disposed in the inlet conduit, the inlet float member coacting with the inlet seat liner to close the inlet conduit upon termination of molten metal flow into the valve body.

27. The dual action valve of claim 26 wherein the inlet seat liner comprises a tapered outer surface cooperating with a tapered recessed portion of the inlet conduit.

28. The dual action valve of claim 25 wherein the inlet float member has a greater density than the molten metal admitted to the valve body, such that the inlet float member closes the inlet conduit under the force of gravity upon termination of molten metal flow into the valve body.

29. The dual action valve of claim 25 wherein the inlet float member is spherical shaped.

30. The dual action valve of claim 25 wherein the carrier member and outlet float member having a combined density lower than the molten metal admitted to the valve body, such that the carrier member and outlet float member are buoyed up to close the outlet conduit if reverse molten metal flow occurs in the outlet conduit.

31. The dual action valve of claim 30 wherein the outlet float member is spherical shaped.

32. The dual action valve of claim 25 wherein the outlet float member is removably received in a cup-shaped recess defined in the carrier member.

33. The dual action valve of claim 32 wherein the outlet float member and the cup-shaped recess have mating spherical shapes.

34. The dual action valve of claim 25 wherein the outlet conduit defines an outlet chamber, and the outlet float assembly is disposed in the outlet chamber.

35. The dual action valve of claim 34 wherein the carrier member defines a central passage in fluid communication with the outlet chamber for passage of molten metal through the outlet chamber.

36. The dual action valve of claim 35 wherein the carrier member further defines a plurality of branch conduits connecting the central passage to the outlet chamber.

37. The dual action valve of claim 35 wherein the outlet float member is removably received in a cup-shaped recess defined in the carrier member, and wherein the carrier member further defines a pressure seal port connecting the cup-shaped recess and central passage for molten metal fluid communication therebetween.

38. The dual action valve of claim 34 further comprising an outlet seat liner disposed in the outlet conduit immediately upstream of the outlet chamber, the outlet float

member coacting with the outlet seat liner to close the outlet conduit upon reverse molten metal flow in the outlet chamber.

39. The dual action valve of claim 38 wherein the outlet seat liner comprises a tapered outer surface cooperating with a tapered recessed portion of the outlet conduit.

40. The dual action valve of claim 25 wherein the housing has a top end and a bottom end, and wherein the top and bottom ends each define circumferential seal grooves for creating seals with molten metal flow conduits to be connected to the top and bottom ends of the housing.